

Using remotely sensed data for climate change mitigation and adaptation: A collaborative effort between the Climate Change Adaptation Science Investigators Workgroup (CASI), NASA Johnson Space Center, and Jacobs Technology.

Amy Jagge
HX5/JACOBS/NASA
2101 NASA Road 1
Houston, TX 77058

Amy Jagge holds a B.S. degree in Geography/Natural Resource Use and Management, and a certificate in Geographic Information Science (GIS). Amy works as a GIS specialist for HX5/Jacobs Technology with the Earth Science and Remote Sensing Unit in the Astromaterials Research and Exploration Science Division at the NASA Johnson Space Center, and has a strong interest in the use of remote sensing systems to monitor and measure land use and land cover change.

Abstract. With ever changing landscapes and environmental conditions due to human induced climate change, adaptability is imperative for the long-term success of facilities and Federal agency missions. To mitigate the effects of climate change, indicators such as above-ground biomass change must be identified to establish a comprehensive monitoring effort. Researching the varying effects of climate change on ecosystems can provide a scientific framework that will help produce informative, strategic and tactical policies for environmental adaptation. As a proactive approach to climate change mitigation, NASA tasked the Climate Change Adaptation Science Investigators Workgroup (CASI) to provide climate change expertise and data to Center facility managers and planners in order to ensure sustainability based on predictive models and current research. Generation of historical datasets that will be used in an agency-wide effort to establish strategies for climate change mitigation and adaptation at NASA facilities is part of the CASI strategy. Using time series of historical remotely sensed data is well-established means of measuring change over time. CASI investigators have acquired multispectral and hyperspectral optical and LiDAR remotely sensed datasets from NASA Earth Observation Satellites (including the International Space Station), airborne sensors, and astronaut photography using hand held digital cameras to create a historical dataset for the Johnson Space Center, as well as the Houston and Galveston area. The raster imagery within each dataset has been georectified, and the multispectral and hyperspectral imagery has been atmospherically corrected. Using ArcGIS for Server, the CASI-Regional Remote Sensing data has been published as an image service, and can be visualized through a basic web mapping application. Future work will include a customized web mapping application created using a JavaScript Application Programming Interface (API), and inclusion of the CASI data for the NASA Johnson Space Center into a NASA-Wide GIS Institutional Portal.